





**Is it too much to ask for a server that's
affordable, flexible, and grows with your business?**

Apparently not.



To help your company be competitive, you have to manage your existing computing resources and plan for the day you outgrow them. You must choose computing solutions today that will fit the needs of the future. And your company's budget.

Work smart.

Our SPARCserver™ 600MP Series offers a complete family of multi-purpose servers to meet your file, database, and compute needs in a wide range of commercial and technical areas.

With multiprocessing and innovative bus technologies, the SPARCserver 600MP Series lets you add more users and more power to your network where you need it most—quickly, easily, and inexpensively.

So what's your next smart business solution? You're looking at it. The SPARCserver 600MP Series.

Do more in less time.

Our multiprocessing server solutions let your company maintain its competitive edge by reducing the time it takes to run applications in all areas of your company.

Of course, server software is an integral part of that solution. Like software previously found only on expensive, proprietary mainframes and minicomputers, our complete server software environment—with enhanced performance, superior system availability, and easy system administration and backup—puts network control where it belongs. In your hands.

Buy only what you need.

As your computing needs grow, so do our servers.

With the SPARCserver 600MP Series, you no longer have to replace entire systems or boards to achieve higher performance. Using MBus, a modular interconnect, the SPARCserver 600MP Series lets you simply plug in additional CPU modules on the system board. This way, you pay only for the power you need—as you need it.

Keep your options open.

The SPARCserver 600MP Series fits in easily with equipment you already have. We pioneered open systems so you can mix and match the best computing solutions and have

them work together seamlessly. In fact, by offloading tasks from your existing mainframes and mini-computers, you make better use of all resources on the network. And existing SPARCserver systems can easily be upgraded to multiprocessing SPARCserver 600MP Series systems.

These days, you have to adapt to change quickly. The SPARCserver 600MP Series keeps your options open. And that just makes good sense.

Connect up with the best.

The SPARCserver 600MP Series also offers world-class networking, fast I/O, and large disk and memory capacities. Our fast SCSI and Intelligent Peripheral Interface (IPI) disks and high-performance SBus and buffered Ethernet connections make sure your valuable data gets to where it's supposed to—fast.

As an industry leader in database price/performance, the SPARCserver 600MP Series gives you fast application throughput *and* the productivity benefits of client-server computing.

Who says you can't have it all?

SPARCserver 690MP

Our most expandable server, the SPARCserver 690MP gives you the power of a high-end super-minicomputer for a lot less money. It features all the performance and availability you need for large database environments.

SPARCserver 670MP

Our high-performance, multi-user SPARCserver 670MP is ideal for centralized information storage and support for large numbers of clients. It's also an ideal multijob compute server, offloading compute- and memory-intensive tasks from desktop workstations. Packaged in a compact deskside enclosure, the SPARCserver 670MP is ideal for the office environment.

SPARCserver 630MP

Our low-cost, multiprocessing SPARCserver 630MP delivers the most affordable, high-performance NFS® fileserver solution for small to medium-size workgroups.

	Enclosure	SPECmarks per CPU	Multiprocessor SPEC throughput (with four CPUs)	Maximum memory
SPARCserver 690MP	16-slot data center cabinet	26.7	90.3	640 MB ECC
SPARCserver 670MP	12-slot office pedestal	26.7	90.3	640 MB ECC
SPARCserver 630MP	5-slot office pedestal	26.7	90.3	128 MB ECC

Bus expansion	Disk	Internal disk capacity	Maximum disk capacity	Tape options
4 SBus, 11 VME	Dual port IPI	10.4 GB	52 GB	150-MB .25-inch tape, 2.3-GB 8-mm helical-scan tape, .5-inch front-loading tape
4 SBus, 7 VME	SCSI	3.9 GB	26 GB	150-MB .25-inch tape, 2.3-GB 8-mm helical-scan tape, .5-inch front-loading tape
4 SBus, 3 VME	SCSI	1.3 GB	26 GB	150-MB .25-inch tape, 2.3-GB 8-mm helical-scan tape, .5-inch front-loading tape

SPARCserver 690MP

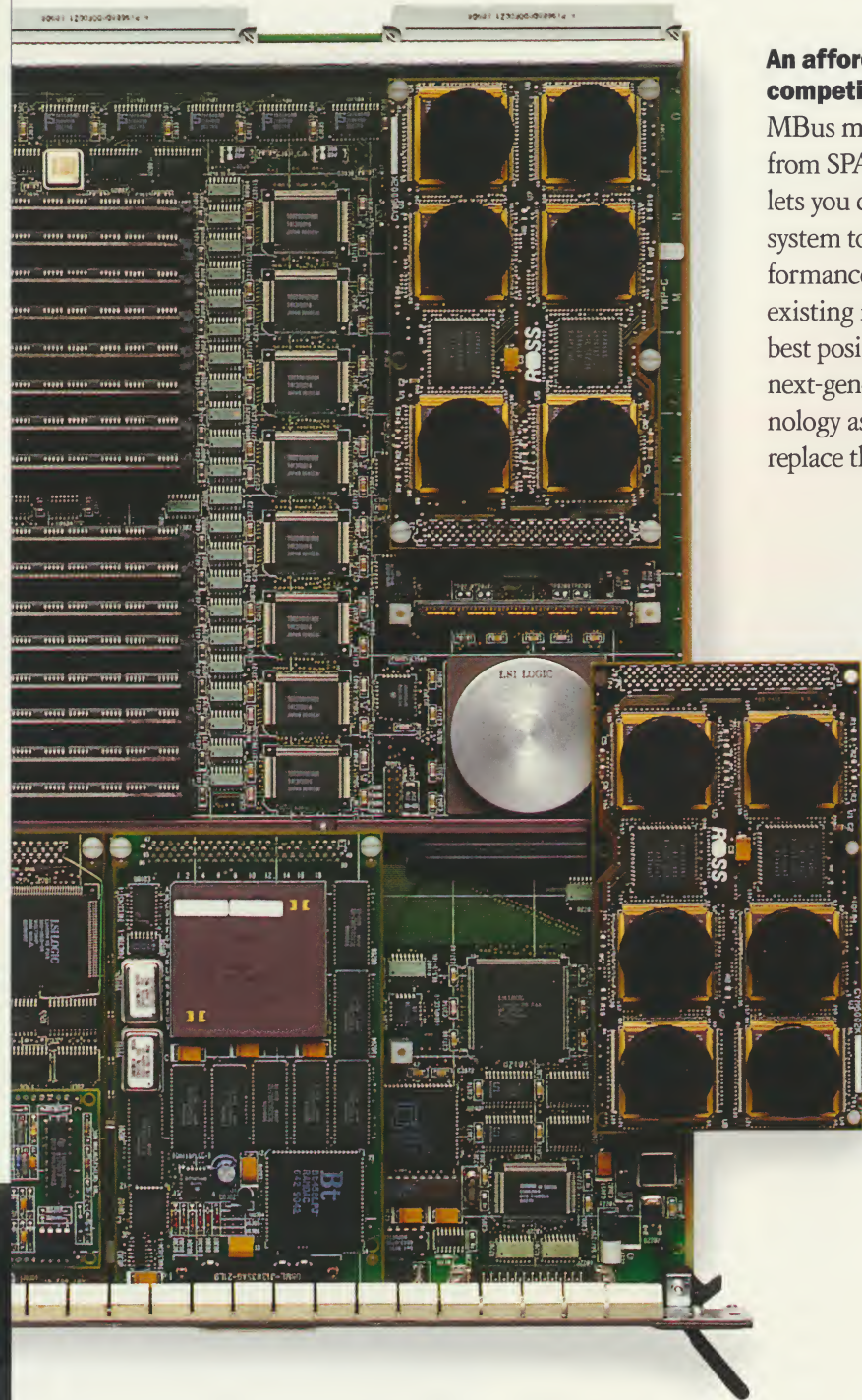
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SPARCserver 630MP

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An affordable way to stay competitive.

MBus modular design, licensed from SPARC International, Inc., also lets you cost-effectively upgrade your system to even higher levels of performance while preserving your existing investments. You'll be in the best position to take advantage of next-generation SPARC® module technology as soon as it's available. Just replace the module, and you're set.

A focused computing approach.

Combined with our SPARCstation™ family of workstations, the SPARCserver 600MP Series gives you the increased personal productivity as well as centralized data

What more could you ask for in a

control and resource management of timesharing systems. So you can continue to use your PCs and terminals *and* easily migrate to client-server computing.

And all our systems are powered by the SPARC microprocessor and run the UNIX® operating system; are linked together in the ONC™ network environment; and are accessible by the OPEN LOOK® graphical user interface. One focused approach. So you know we mean business.

The modular design of MBus lets you easily and affordably expand and upgrade your SPARCserver 600MP Series system to take advantage of the newest advancements.

**Premier client-server
system software.**

The powerful SPARCserver 600MP Series demands an equally powerful operating system. Based on the industry-leading UNIX operating system, SunOS™ is the premier client-server system software environment. SunOS software increases group and individual productivity by distributing functionality such as multitasking, powerful development tools, and more across the entire client-server



SunOS software offers multitasking, a powerful development environment, and scalable growth—everything to make your organization even more productive.

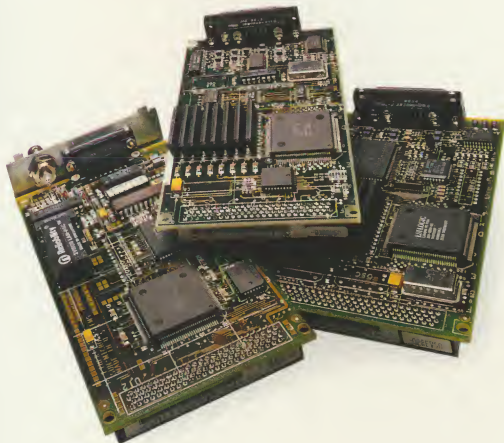
environment, from laptops to supercomputers. And in-house developers using UNIX can quickly develop and customize applications—keeping you competitive.

By maintaining full compatibility with its previous releases, SunOS software lets your existing applications take advantage of our multiprocessing environment—without any modifications. And you get immediate access to more than 3600 SPARCware™ solutions.

SunOS software complies with all major industry standards, including POSIX 1003.1 and FIPS 151-1, SVID Issue 2 and 3, and XPG2 base and XPG3 components.

We're glad you asked.

SPARCserver system?



Because the SPARCserver 600MP Series uses standard SBus and VMEbus expansion interfaces, hundreds of Sun and third-party products—from I/O controllers to network interfaces—are available to you.

Our complete line of server software increases database and fileserver performance, keeps users online, maintains the integrity and availability of valuable data, and simplifies administration tasks across the network.

Get fast database performance.

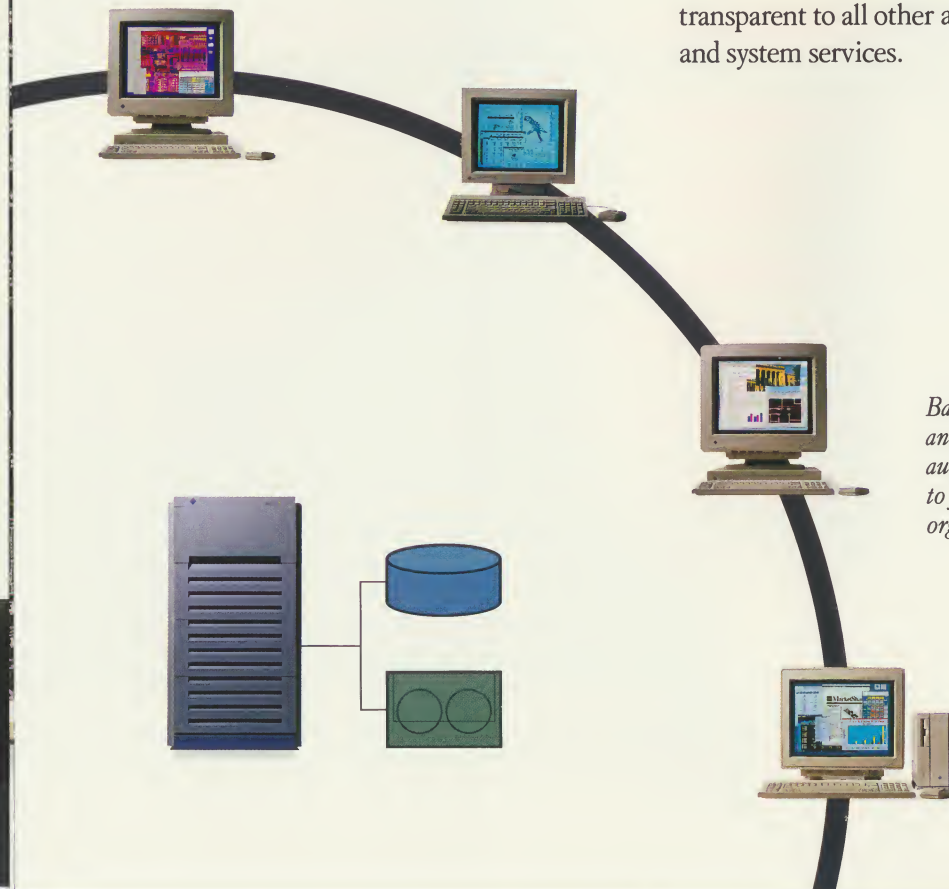
If you're using popular databases such as ORACLE®, SYBASE®, INFORMIX® OnLine, and ASK/Ingres, you can boost performance with Sun Database Excelsator™, a specially tuned SunOS kernel optimized for RDBMS servers. In a client-server environment, it improves database management system transaction throughput and increases the number of users supported. Sun Database Excelsator software is completely transparent to all other applications and system services.

To increase NFS responsiveness of SPARCserver systems with heavy workloads, we offer Sun Prestoserve. It significantly improves NFS throughput, so heavily loaded file-servers can support more clients and provide better response time. Like Sun Database Excelsator, Sun Prestoserve is completely transparent to applications. Get immediate performance improvements—without porting or recompiling.

Do backups anytime—automatically.

Getting to your data fast is critical for your organization. Making sure that data can be backed up—and restored—safely and easily is equally important. With Backup Copilot™, system administrators can perform online remote or local backups of several gigabytes of data automatically without operator intervention, reducing administrative effort and costs. Users can read or write to files as they are being backed up without any risk to data integrity. So system administrators have more flexibility

Backup Copilot lets system administrators do local and remote backups of large amounts of data online—automatically. What's more, users can safely write to files during backups. Now everyone in your organization saves time.



Make your data twice as safe.

Not only can users continue working during system backups and restores, but they can also carry on in case of a disk or controller failure.

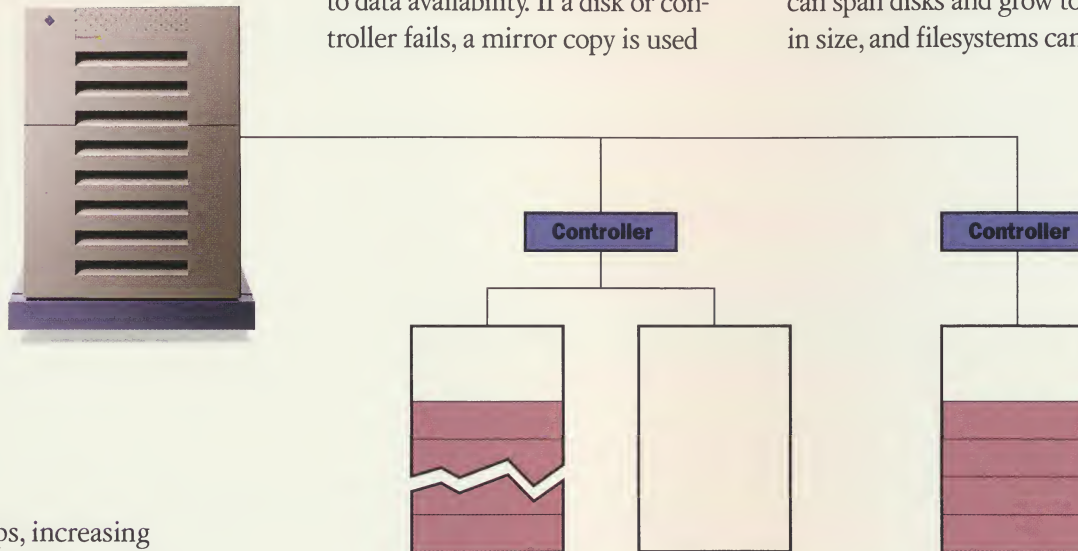
Online™: DiskSuite provides enhanced disk mirroring, large UNIX filesystems with online growth, and disk striping. Disk mirroring is the key to data availability. If a disk or controller fails, a mirror copy is used

automatically. Users go on working as if nothing happened. The unique "hot spare" feature then generates a new mirror automatically, restoring full protection to user data and eliminating the need for system administrators to intervene manually.

Using Online: DiskSuite's concatenation feature, individual files can span disks and grow to 2 GB in size, and filesystems can be

expanded to the size of the total system disk capacity—more than 50 GB on a SPARCserver 690. And filesystems can be expanded online, without interruption to users. In addition to these features that improve system availability and ease the burden on system administrators, Online: DiskSuite also improves system performance by allowing files to be striped across multiple disks, enabling concurrent access and increased throughput.

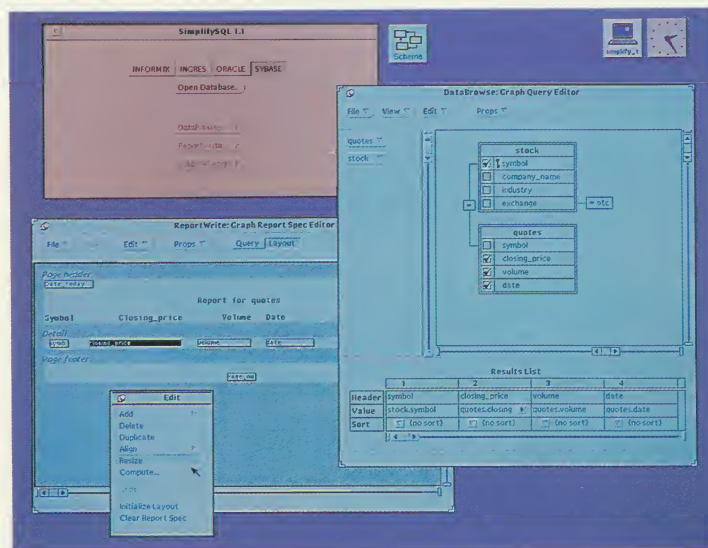
While Online: DiskSuite offers protection in the event of disk or controller failure, Online: IPI Dual Port Tools lets administrators assign a disk to either of two systems, so users can access their data from another server in case of system failure. Once the systems and disks are properly configured, reassignment of disks to systems is controlled completely by software commands. Online: IPI Dual Port Tools provides utilities to enable the development of programs that use the commands.



Online: DiskSuite generates a mirror copy of data automatically, so users can still access their data in case of disk or controller failure.

in scheduling backups, increasing overall system availability. And with new algorithms, which fully exploit the latest mass-storage technology, backup speed is dramatically improved.

Backups are useful only if administrators can quickly and easily restore the data they've backed up. Backup Copilot handles file recovery problems by automatically generating electronic tape labels and an online index database.



"Our products developed on Sun platforms have taken the database world by storm. Sun's NFS system is the key to letting users easily get to what they need—even people in far-flung locations."

Informix Software, Inc.

"Ingres customers show a continuing preference for products developed in the Sun environment. We're not about to turn our back on that."

Ingres Corp.

Our systems run the most popular database packages.

Lots of customers are buying relational database management packages on our systems. In fact, Sun is the leading UNIX platform vendor for the most popular RDBMSs, used in application areas such as telecommunications, accounting, customer service automation, inventory management, and financial trading.

"Sun is a trend leader in the marketplace. And Sybase wanted to put its products on systems with market presence. From our beginnings, we've seen Sun among those at the forefront, providing powerful systems and committed to an open environment."

Sybase, Inc.

"There has to be a 'glue' to bind the servers together if one is going to take advantage of multiple-server environments. The Sun architecture is ideal for this approach, thanks to its large storage and memory capacity and speed. It makes sense to put the database server on these machines."

Oracle Corp.

One source for systems and peripherals, too.

For midrange deskside storage, our industry-leading 1.3-GB SCSI disks offer cost-effective, exceptionally fast performance for SPARCserver 630MP and SPARCserver 670MP systems. They are available in single-disk enclosures as well as in a subsystem offering up to 10.4 GB.

For the highest capacity and functionality, we provide the IPI subsystem for the SPARCserver 690MP.



**SPARCserver 600MP Series
Mass Storage Options**

	SCSI	IPI
Format	5.25 inch	5.25 inch
Formatted capacity	1.3 GB	1.3 GB
Average seek time	11.5 msec	11.5 msec
Transfer rate	3.0-4.5 MB/sec	3.0-4.5 MB/sec
Dual ports	No	Yes
Maximum drives per controller	4	8

It enables you to efficiently manage large disk farms and system availability features provided by Online: IPI Dual Port Tools software. The IPI subsystem is the industry's first IPI drive to incorporate zone bit recording, delivering higher performance at lower costs. You can also connect special-purpose peripherals and integrate the hundreds of compatible hardware peripherals available in our *Catalyst™* catalog.

Our high-performance mass-storage products conform to industry standards, so they're compatible with products from other peripheral manufacturers. And all our peripherals go through extensive reliability, environmental, and hardware- and software-integration testing. So you're guaranteed the highest-quality mass-storage subsystems available.

SPARCserver 600MP Series Specifications

Processor	
Integer unit	40 MHz SPARC
Floating-point unit	Weitek
Memory Cache Size	
	64 KB per CPU
I/O Cache Size	
	32 KB
Memory Management	
Type	SPARC reference MMU
Virtual memory	4 GB per process
Contexts	4096
I/O interface	DVMA™
Ethernet Interface	
Type	Coaxial cable
Date rate	10 Mb/sec
I/O Ports	
Type	Two RS-232C/RS-423 serial ports standard
Synchronous ports	Both ports available for synchronous communications
Environment	
Humidity	
Operating* (without media)	5% to 95%, noncondensing RH
Nonoperating* (without media)	5% to 95%, noncondensing RH
Operating (with media)	20% to 80%, noncondensing RH, max. wet bulb temperature of 25° C
Nonoperating (with media)	90%, noncondensing @ 40° C

Temperature	
Operating* (without media)	10° C to 40° C (50° F to 104° F)
Nonoperating* (without media)	-40° C to 75° C (-40° F to 167° F)
Operating (with media)	15° C to 32° C (59° F to 90° F)
Nonoperating (with media)	-20° C to 60° C (-4° F to 140° F)
With .5-in. tape	
Operating	15° C to 32° C (59° F to 90° F)
Nonoperating	-20° C to 60° C (-4° F to 140° F)
Acoustics	
5-slot office pedestal	6.05 bel/46.3 dBA (SPARCserver 630MP)
12-slot office pedestal	6.10 bels/52.5 dBA (SPARCserver 670MP)
16-slot data center cabinet	7.61 bels/61.8 dBA (SPARCserver 690MP)
Regulations	
Meets or exceeds the following requirements:	
Safety	UL 478, CSA 22.2, No. 220-M1986, TUV(IEC 380) (SPARCserver 630MP, SPARCserver 670MP) TUV(IEC 950) (SPARCserver 690MP)
RFI/EMI	FCC Class A, FCC Part 15, Subpart J, VCCI Class 1, VDE Class A, VDE 0871
X-ray emissions	DHHS Rule 21, (Subchapter J, PTB)
Static discharge	15 KV—no hard errors

Electrical

5-slot office pedestal (SPARCserver 630MP)	
Line voltage	100-120/200-240 VAC
Voltage tolerance	87-132/180-264 VAC
Frequency single phase	50 or 60/50 or 60 Hz
Frequency tolerance	47-63/47-63 Hz
Max. running current	12/6 A
Max. DC power output	520/520 W
Max. AC power input	750/750 W
12-slot office pedestal (SPARCserver 670MP)	
Line voltage	100-120/200-240 VAC
Voltage tolerance	87-132/180-264 VAC
Frequency single phase	50 or 60/50 or 60 Hz
Frequency tolerance	47-63/47-63 Hz
Max. running current	12/6 A
Max. DC power output	925/925 W
Max. AC power input	1325/1325 W
16-slot logic enclosure (SPARCserver 690MP)	
Line voltage	200-240 VAC
Voltage tolerance	180-264 VAC
Frequency single phase	50 or 60 Hz
Frequency tolerance	47-63 Hz
Max. running current	10 A
Max. DC power output	1200 W
Max. AC power input	2000 W
16-slot data center cabinet (Includes 16-slot logic enclosure, eight IPI-2 disks, front-loading .5-in. tape, and two 5.25-in. devices)	
Line voltage	200-240 VAC
Voltage tolerance	180-264 VAC
Frequency single phase	50 or 60 Hz
Frequency tolerance	48 Hz
Max. running current	24 A
Max. AC power input	3015 W

Expansion cabinet (Includes 32 IPI-2 disk drives)

Line voltage	200-240 VAC
Voltage tolerance	180-264 VAC
Frequency single phase	50 or 60 Hz
Frequency tolerance	47-63 Hz
Max. running current	24 A
Max. AC power input	2352 W

Dimensions and Weights

5-slot office pedestal (SPARCserver 630MP)	
Height	60.0 cm (23.6 in.)
Width	31.9 cm (12.6 in.)
Depth	70.2 cm (27.6 in.)
Net weight (max.)	47.7 kg (105 lbs.)
Shipping weight (max.)	51.3 kg (113 lbs.)
12-slot office pedestal (SPARCserver 670MP)	
Height	65.3 cm (25.7 in.)
Width	48.0 cm (18.9 in.)
Depth	72.6 cm (28.6 in.)
Net weight (max.)	99.9 kg (220 lbs.)
Shipping weight (max.)	118 kg (260 lbs.)
16-slot data center cabinet (SPARCserver 690MP)	
Height	142.2 cm (56 in.)
Width	74.9 cm (29.5 in.)
Depth	97.2 cm (38.3 in.)
Net weight (no peripherals)	234.5 kg (517 lbs.)
Net weight (max., fully loaded)	358.5 kg (788 lbs.)
Shipping weight (max.)	417.6 kg (918 lbs.)

* Tested per Sun Microsystems Environmental Test Specifications Summary 950-1316-03 Rev A



Sun Microsystems

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Executive Update:
SPARCserver Solutions



Sun Microsystems Computer Corp.



The SPARCsystem Family of Network Computing Products

Sun Microsystems is a leader in network computing with the SPARCsystem family of high performance workstations and servers. Sun built the SPARCsystem family around a Reduced Instruction Set Computer (RISC) technology called Scalable Processor ARChitecture (SPARC).

With the SPARCsystem family, Sun delivers a complete range of binary-compatible systems that meet the diverse needs of network computing environments. SPARCsystems provide balanced CPU, I/O, and networking features for fast, cost-effective performance across the entire product family, from inexpensive desktop workstations to extremely powerful multiprocessing data-center servers.

The SPARCsystem family uses Sun's implementation of the UNIX operating system, which combines the industry's two dominant versions of AT&T System V and 4.3/4.2 BSD, into the powerful Solaris™ operating system. To facilitate network computing, Sun offers only this one operating system.

SPARCservers: Technology for the Workgroup and Beyond

Sun's reputation was built as the volume supplier of high-performance technical workstations. Superior system design is what drove the demand for high volume production, which in turn drove costs and prices down, resulting in leadership price/performance. Sun has taken the same principles of technology innovation using industry standards and open systems which contributed to its workstation success and applied them to high-performance multi-user systems, called servers.

Based on the same RISC processor technology as desktop workstations, SPARCservers provide greater scalability, upgradability, and higher performance, while maintaining complete binary compatibility with all SPARC-based desktop workstations. In addition, SPARCservers deliver very high performance I/O for optimum throughput of typical server applications like database or NFS. This paper introduces Sun's SPARCserver products and the solutions they can provide.



SPARCservers: Foundation for Workgroup Computing

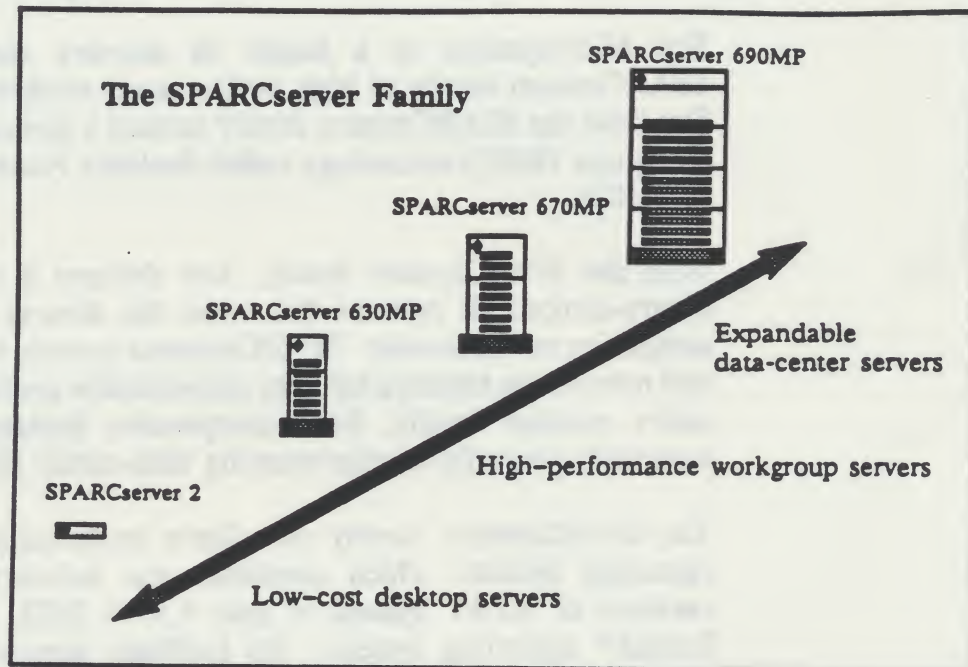


Figure 1

The SPARCserver family of products, shown in figure 1, offers a full range of systems to meet the various information technology (IT) needs of organizations, from low-cost office servers to larger, high-performance data-center servers.

General-Purpose Systems for All Application Environments

A server is basically a system that acts as a shared resource and provides access to other shared resources on the network. The way in which the server is shared depends upon the application environment. *Database servers* run the back-end database software and store data centrally, providing clients with quick, accurate response. *File servers* simply store large files (text, images, data, etc.) that need to be shared among many users, providing users access via NFS (the Network File System). *Compute servers* act as a centralized resource onto which users can off-load highly complex, or compute-intensive, tasks, thus freeing up their desktop machine for other uses. *PC-LAN servers*, of course, provide a means for linking groups of PCs together and allowing users to communicate and share data locally.



Because SPARCservers were designed as general-purpose high-performance systems, they perform well in any of these different application environments, and can even perform multiple functions simultaneously. That is, a server which is being used primarily for NFS file service, for instance, could also be used to off-load compute tasks from overburdened workstations, or act as a PC-LAN server at the same time.

Balanced Design Delivers High Throughput & Smooth Growth Path

All systems in the SPARCserver series feature balanced CPU, I/O, and networking performance. *Balanced high performance* means that these systems are designed to deliver overall high throughput which results in greater end-user productivity. Because a system is only as fast as its slowest component, design innovation is included in all major subsystems, such as I/O and networking, not just in CPU technology. SPARCservers incorporate the best, most reliable technologies in all aspects of system design.

SPARCservers also incorporate features of expandability, connectivity, and upgradability which rival those of proprietary minicomputers and mainframes costing 10 times as much. By using a high-speed open bus called the MBus for CPU modularity, it is possible to add additional compute power to the server very cost-effectively, at the same time preserving the investment in application software, memory, and disks. A SPARCserver can literally be transformed into a new system simply by adding or replacing a small CPU module (see next section for more detail).

All SPARCservers utilize the high-performance, industry standard SBus for I/O connectivity. The hundreds of available SBus options offer low-cost high-performance connectivity. Larger SPARCservers also incorporate industry standard VMEbus slots for even greater expandability.

Other SPARCserver expandability features include:

- Up to 52 GB of lightning fast IPI disk storage
- Up to 640 MB of highly reliable ECC memory
- Up to 130 terminals directly connected
- Ethernet, FDDI, Token Ring interconnectivity
- CD-ROM, 1/2"-, 1/4"-, 8mm- tape drives

Multiprocessing: Power for the Workgroup

Low-cost desktop SPARCservers utilize a single high-speed SPARC CPU delivering 28.5 MIPS of performance. Office workgroup servers and expandable data center servers utilize a technology called multiprocessing to deliver even greater performance. These multiprocessor systems can be configured with multiple high-speed SPARC CPUs.

As the term implies, multiprocessor systems use multiple CPUs and share main memory to execute a series of instructions. In contrast, a uniprocessor system uses a single CPU with dedicated main memory.

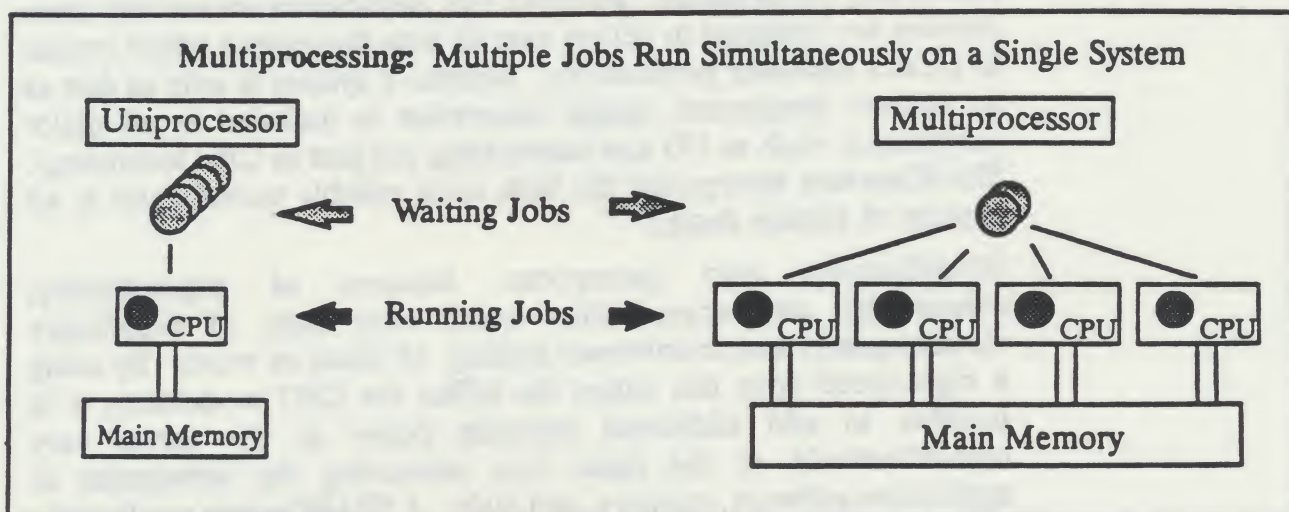


Figure 2

The advantage of using a multiprocessor design for multiuser servers is evident in figure 2. Multiprocessors can satisfy the workgroup's insatiable appetite for processing power by executing multiple jobs simultaneously, allowing a single system to support *more users* and deliver better performance to *each user*.

While other computer vendors also offer systems with the advantage of multiprocessing, SPARCservers offer the greatest flexibility and upgradability. They provide easy growth paths while maintaining Sun's fierce commitment to open systems, industry standards, RISC, and Unix.

Sun's Multiprocessor Servers Maximize Investment Protection

The SPARCserver 600MP family incorporates a unique design feature called the MBus which allows customers to easily, cost-effectively upgrade their systems to new levels of performance as their needs warrant. All SPARCserver 600MP systems can accommodate two- or four-processor configurations. Upgrading from a two-processor system to a four-processor system is as simple as plugging in a postcard sized module containing the two additional processors. And perhaps more importantly, because SPARC CPU technology advances at such a rapid rate, Sun has already committed to providing the next generation of processors on SPARC modules, thus providing easy, cost-effective upgradability for multiple generations of systems.

SPARCserver 600MP: Unprecedented Expandability and Upgradability

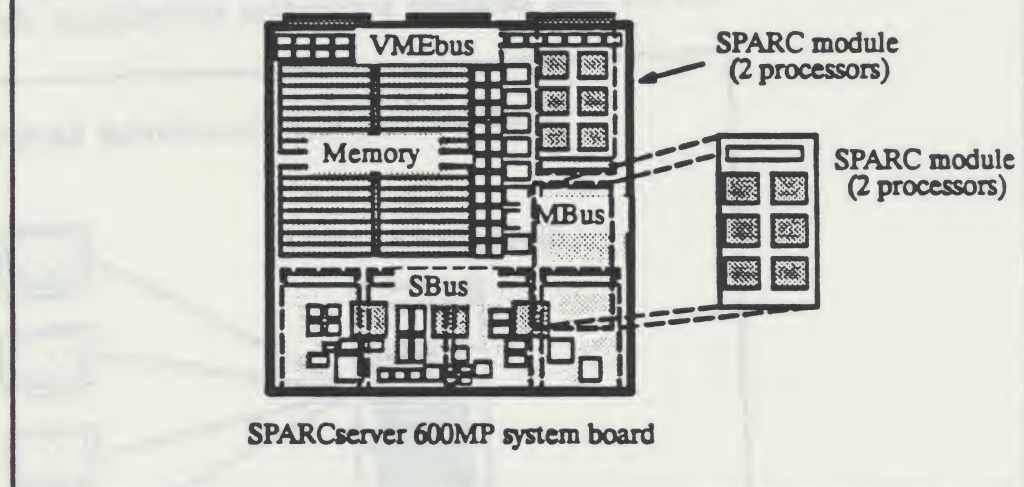


Figure 3

This key design philosophy of modular upgradability, shown in figure 3, is a big win for SPARCserver customers. It provides the smoothest growth path possible. It allows customers to add higher and higher levels of performance with easy, cost-effective upgrades by simply adding additional processors or upgrading to future generations of CPU technology. And at every step the initial investment in the system is preserved. Application software, disks, memory, and other system resources are completely compatible with each generation's upgrade. The result: low cost of ownership for the highest performance systems available.



Applications: Balanced Performance for any Environment

As mentioned earlier, SPARCserver systems can be used in many different ways. Due to their flexibility and connectivity features, SPARCserver systems can be configured as ideal database servers, compute servers, file servers, or PC-LAN servers. The next few sections show how SPARCserver systems can be deployed to bring additional resources to a user network.

Increased Performance for Timesharing Environments

For example, SPARCserver systems can be configured into a database environment in several different ways. The SPARCserver 690MP can run the total database application environment shown in figure 4.

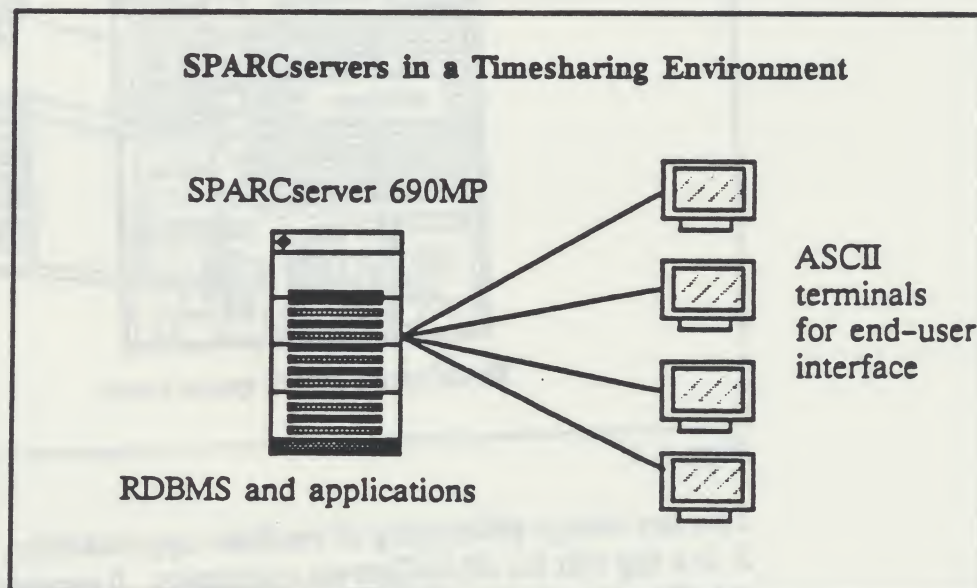


Figure 4

Users on terminals can be directly linked to the machines through serial connections or by Ethernet through terminal concentrators. In this configuration, both the database engine and the client applications would run on a single SPARCserver system.



Seamless Computing in Heterogeneous Environments

SPARCservers can also be configured into a heterogeneous environment where support for workstations, PCs, and terminals is required. In this configuration, the database application front-end can run on the desktops that have CPU power (e.g., workstations and PCs) while the database itself resides on the server. The server CPU runs the database engine.

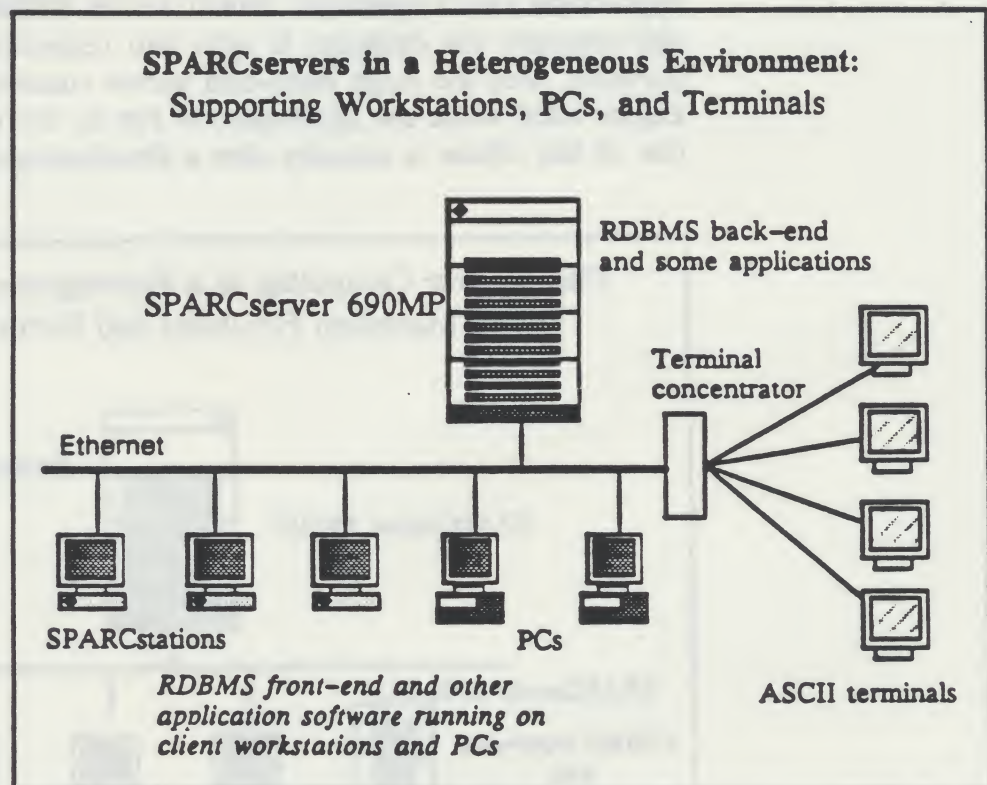


Figure 5

At the same time, users on terminals rely on the server for all system services, as in the timeshare environment. These terminals can either be direct-connect through serial ports, or consolidated through a terminal server or concentrator. Figure 5 shows a view of this mixed application environment.



True Client/Server Computing for Productivity and Flexibility

For maximum productivity and greatest flexibility it may be desirable to deploy this application in a true client/server fashion.

In this environment the SPARCserver 690MP would run the database engine only. The SPARCstations and PCs, running the user applications and doing development work, are connected by Ethernet, as in the heterogeneous environment. Terminals are joined to an application server (pictured: SPARCserver 670MP, see figure 6). In this example the database is split into respective client and server portions, with the large back-end server running only the database engine itself while the application is run by the clients. In this case one of the clients is actually also a timesharing/application server.

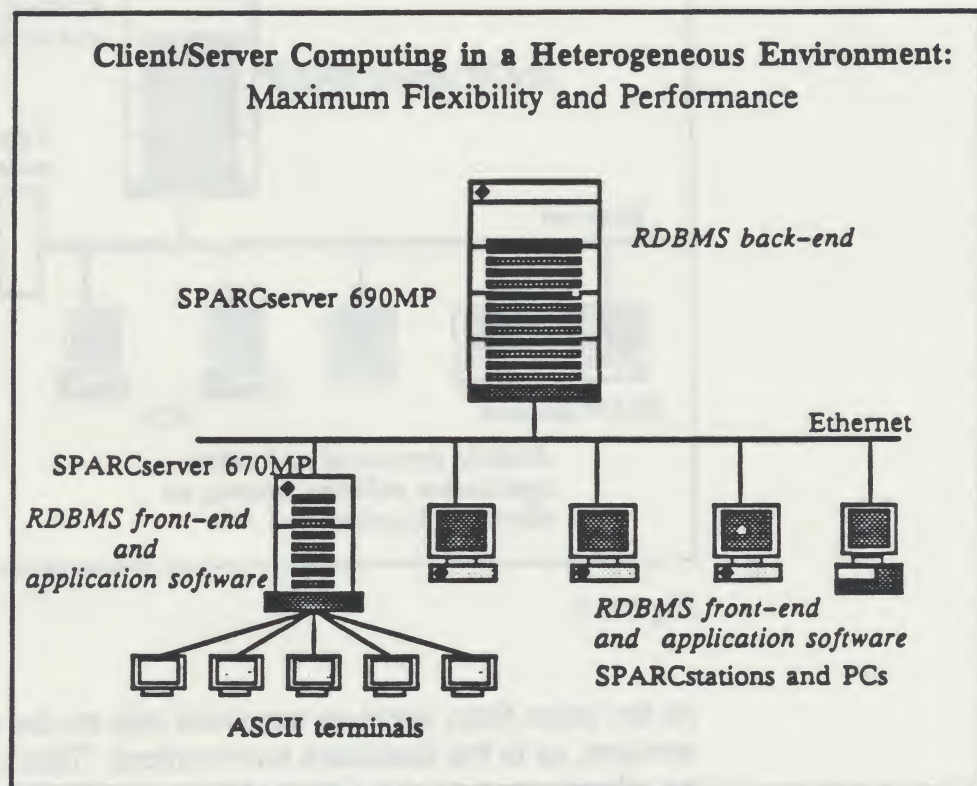


Figure 6

Real Advantages of the Client/Server Environment

As a client, the user receives optimal productivity through a dedicated resource on the desktop, while maintaining access to the shared resources (data, applications, compute power) on the server.

The user sees only the graphical user interface (GUI) which allows him/her to open multiple windows and work on several tasks

simultaneously, but it is the server that makes this possible. The server can run different applications for different users, or different parts of the same application, at the same time. While one user accesses the database server another user can access the application server.

In a database environment, for instance, users running an order/entry application (residing on the server) would have an actual order/entry screen in one window, while in another window they could be putting together a memo to the salesperson explaining that the part numbers on the sales order are not valid. In yet another window, users could be logged into the manufacturing database, also on the back-end server, to verify the lead time on a certain part. Users now have all of these applications available to them at the same time and can easily move data from one application to the other.

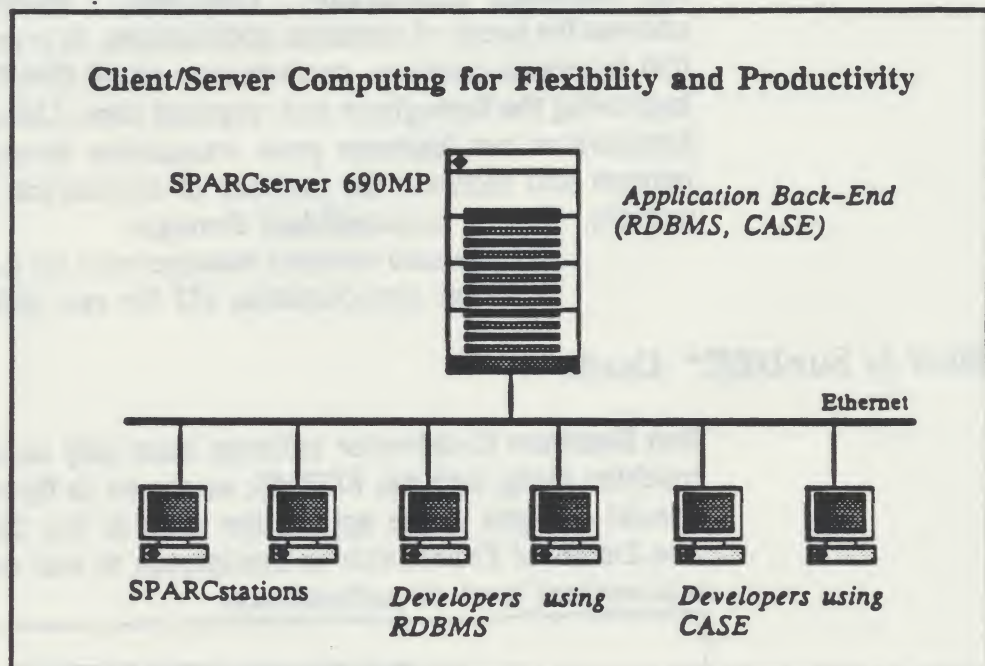


Figure 7

The same model is also applicable in a development environment, (such as CASE), shown in figure 7. The programmer can use the processing power of the desktop for editing, compilations, and/or debugging. At the same time the compilation is running, the programmer can be debugging another piece of code in another window. Or, to improve on overall throughput, the programmer could off-load the compilation to the back-end server, freeing up compute cycles on the desktop.

The advantages of the client/server environment, then, are increased productivity and flexibility. Users have access to more information more quickly and easily. And as the application changes or grows, additional resources can be added or redeployed with minimal incremental investment.



Sun Server Software

In addition to providing customers with the best possible server hardware solutions, Sun also provides the means to enhance the functionality of SPARCserver systems with:

- Enhanced Applications Performance
- Ease of Use
- High Availability (continuous access to data)

Sun Database Excelsator™ for Optimization of RDBMS Performance

Sun Database Excelsator™ (SunDBE™) software is designed to address the needs of database applications. It is an unbundled product that increases database performance of all SPARCserver systems by improving the throughput and response time. Using the Sun Database Excelsator can increase peak transaction throughput by up to 50 percent and increase the number of concurrent users by up to 500 percent. This is accomplished through:

- Enhanced memory management for database applications
- Faster asynchronous I/O for raw disk devices

How Is SunDBE™ Used?

Sun Database Excelsator software runs only on the database server machine along with the RDBMS, as shown in figure 8. It requires no special changes to the application code or the database installation. Sun Database Excelsator is transparent to end users; all they see is a consistent level of performance.

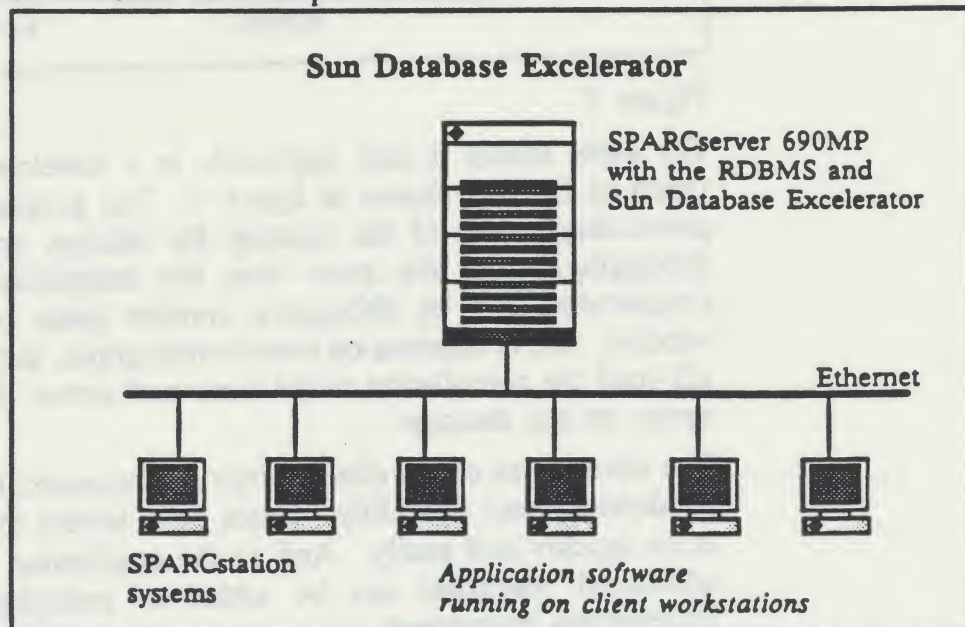


Figure 8



Sun Backup Copilot for System Administration

Sun Backup Copilot provides increased functionality for SPARCsystem network backups. It does this by addressing three areas:

- Safe and consistent backup with users online
- Higher speed backup and restore
- Ease-of-use

How Is Sun Backup Copilot Used?

Sun Backup Copilot, shown in figure 9, is unbundled software which runs on the server providing system administrators with the ability to do *automatic, unattended* backup of files across the network. Backup Copilot minimizes the impact to users on the network by performing higher speed backups while users are still on-line. In other words, it is not necessary to interrupt any user activity in order to successfully backup the systems on the network.

In addition, all users have access to the Index and Recovery features of Backup Copilot, allowing them to see when their work was last successfully backed up, and to recover these files with minimal or no operator assistance should the need arise. System administrators, meanwhile, can control the backup activity anywhere on the network from their workstations, and monitor the activities to ensure no inadvertent errors occur.

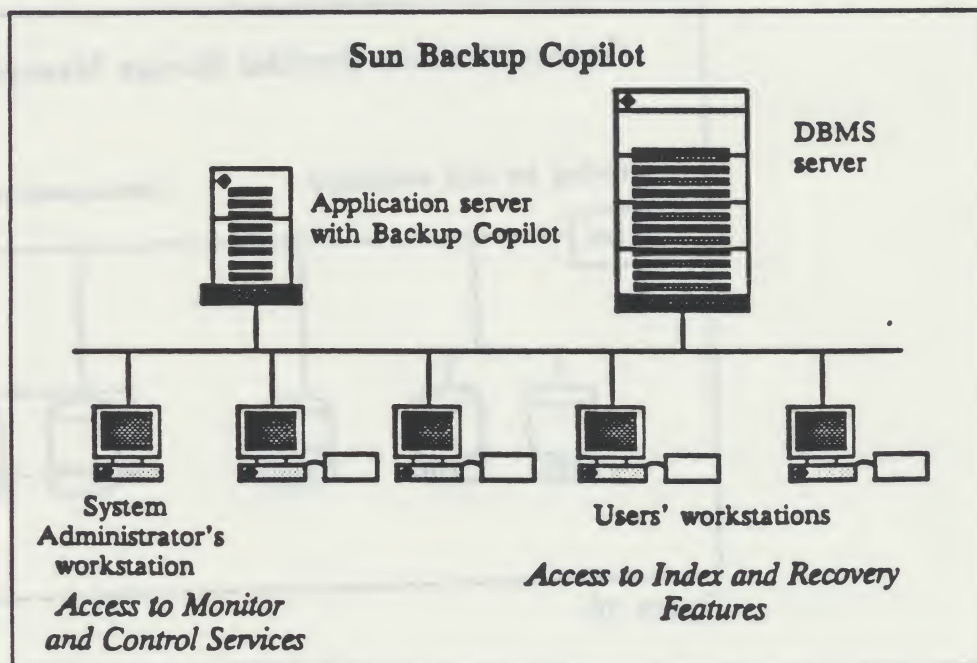


Figure 9



Online: DiskSuite For Increased Server Flexibility and Availability

Online: DiskSuite is a software product that provides disk storage management options while increasing the availability of data for critical applications. DiskSuite has several components:

- Disk Mirroring
- Disk Concatenation
- Online File System expansion

How Is Online: DiskSuite Used?

Online: DiskSuite software, shown in figure 10, resides on a server and is used to manage the disk configuration of that server. Disk *mirroring* enables administrators to keep a second or third copy of an important disk's contents. Whenever any data is written to or edited on the primary disk, the identical changes are made on the mirror(s) of that disk. Even in the event of complete disk failure, users can still have access to important data by accessing a mirrored version. Disk *concatenation* allows for the creation of files that are actually larger than the capacity of any single disk drive by allowing files to span multiple disk drives (up to two gigabyte). This feature also allows the creation of very large file systems (up to one terabyte). All these features are implemented for the convenience of the system administrator and are completely transparent to the user.

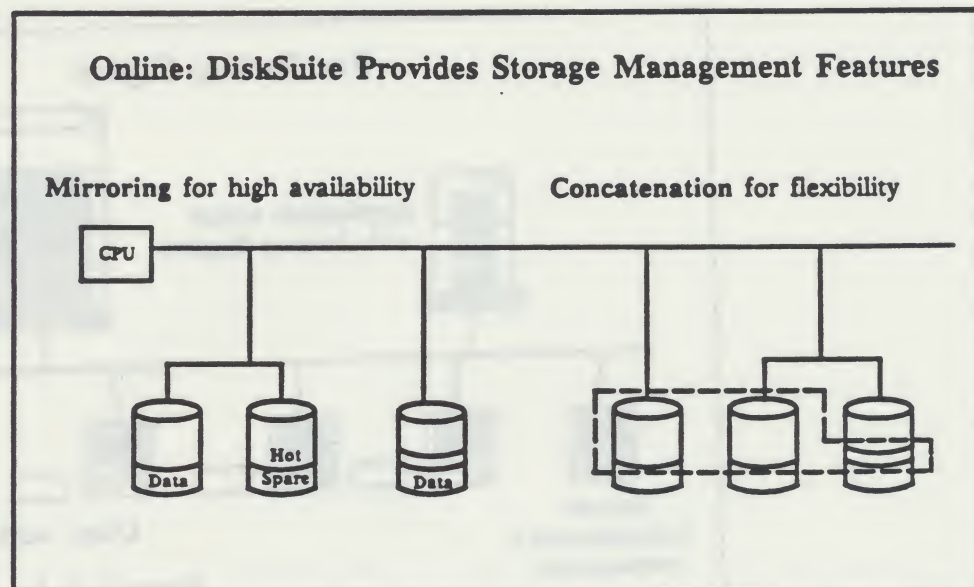


Figure 10

Online: IPI Dual-Port Tools For High Availability

Online: IPI Dual-Port Tools is a software toolkit that provides the ability to build system configurations for high data availability. The toolkit assures that alternate access paths to important data are available in the event of a failure of a system component.

How Is Online: IPI Dual-Port Tools Used?

Because IPI disks are dual-ported, they can be connected to two separate disk controllers simultaneously. These two controllers can, in turn, reside on two completely different systems. In this case (see config. #1, figure 11), even if one of the systems or one of the controllers were to fail, data on the disk can be accessed using the other system and controller.

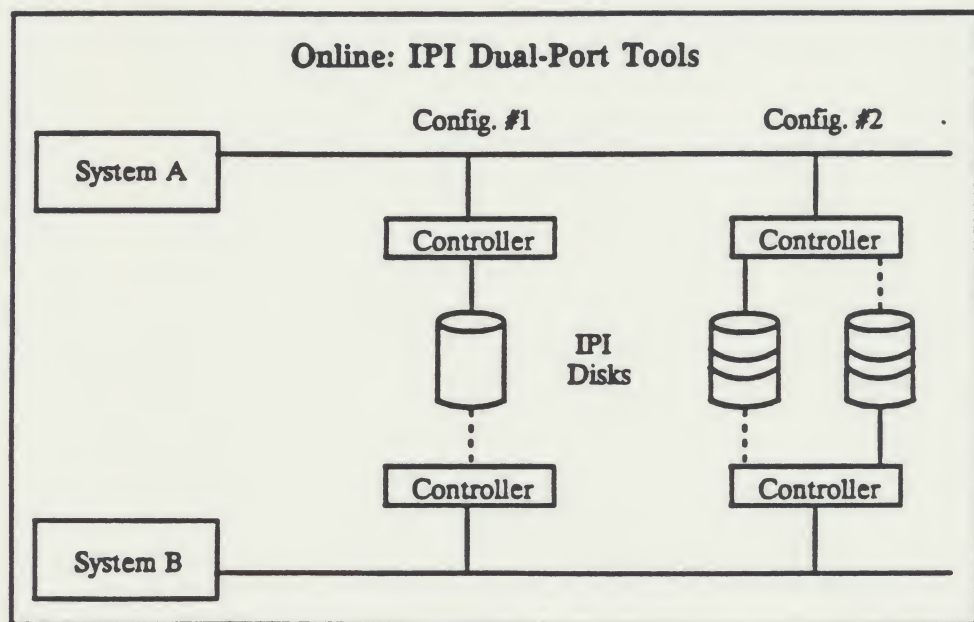


Figure 11

Used in conjunction with disk mirroring, the data becomes even more available. In this case (see config. #2), identical copies of the same data are stored on two separate disks, each connected to two separate systems via two different controllers. If one of the systems were to fail, or one of the controllers failed, or even one of the disks themselves failed, there is still a viable path to that critical data.

Because Dual-Port Tools is really a toolkit of software pieces, and because data integrity and availability can be mission-critical, it is recommended that qualified consulting or professional services be employed to custom-port this tool to specific user applications.